Vol. 14. Parts 11–12.* Pp. 129–161. 31st December, 1945.

THE PROCEEDINGS
OF THE
ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Series B.
TAXONOMY
(being the continuation of Stylops)

World List abbreviation: *Proc. R. ent. Soc. Lond.* (B)

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LONDON:
PUBLISHED BY THE SOCIETY AND
SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W.7

Price 8s. 0d.

* *With title-page, contents and index.*

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AFRICAN HALICTINE BEES (II)

By Professor T. D. A. Cockerell, F.R.E.S.

(*University of Colorado.*)

Halictus (Oxyhalictus) nyasensis sp. n.

♀. Length about 9 mm., anterior wing about 6 mm.; black, robust, the head and thorax conspicuously hairy, the hair of face, front and cheeks white, but of head and thorax above greyish, but not black; head broad, approximately circular seen from in front; clypeus moderately produced, mainly dull and rough, but with a shining reversed V, which meets a shining supraclypeal space; tongue with a long linear extension; mandibles and antennae black, the flagellum short; a shining spot on middle of front, above base of antennae; mesonotum dull, somewhat shining on disc, but not at all polished, with no marginal hair-band; scutellum shining on disc; postscutellum with inconspicuous pale hair; area of metathorax very short, sharply defined posteriorly, with irregular rugae; the microscope shows the mesonotum and scutellum to have dense strong punctures all over; tegulae large, black; wings conspicuously dusky; stigma small, dark brown; nervures dark brown, but outer nervures weakened; second submarginal cell receiving recurrent nervure near apex; legs black, the tarsi red at end; abdomen with basal bands of pale tomentum on tergites 2 to 4, that on second interrupted, on third and fourth broad and entire; the hind spur has three short obtuse teeth, the first one broad.

Nyasaland : Chiromo (*R. C. Wood*, 2119). Rather like *H. nairobicus* Ckll., but easily separated by the dark tegulae. The hind spur is suggestive of *H. macrurops* Ckll., but the two insects are very distinct. The following key separates a series of *Halictus* from Nyasaland.

	Tegulae at least partly clear red	1.
	Tegulae dark, black or almost	2.
1.	Mesonotum dull; apex of wings strongly brownish . . .	*chiromensis* Ckll.
	Mesonotum somewhat shining; apex of wings clear . . .	*lamborni* Ckll.
2.	Abdomen with broad bands of tomentum	*nyasensis* Ckll.
	Abdomen without such bands, but with slender tegumentary bands . .	3.
3.	Smaller; scutellum shiny, bigibbous	*neavei* Ckll.
	Larger : scutellum dull, not bigibbous	*aberdaricus* Ckll.

Halictus liberiensis sp. n.

♀. Length about 8·3 mm., anterior wing 6·6 mm.; black, the mandibles faintly brownish towards end, the flagellum dark brown beneath, tegulae large and very dark brown, wings faintly dusky. Very much like *H. monsleonis* Ckll. from Sierra Leone, but distinguished by the suboval (instead of broad and rounded) head, the duller mesonotum, and the scutellum with two shining elevations (instead of shining right across). The venation is essentially the same, and both species have the metathoracic area with strong plicae. The clypeus is highly polished, with a median groove, and the face on each side of clypeus is highly polished, but the supraclypeal area is dull. The abdomen has inconspicuous hair-bands at bases of second to fourth tergites, interrupted in the middle. The hind spur has three teeth, only the first one large; it is not essentially different from that of *H. monsleonis.*

Liberia : Memeh Town, 20 Aug., 1926 (*J. Bequaert*).

Halictus prominens Cockerell.

Cape Town: Lion's Head, July 1920 (*R. E. Turner*). The third and fourth tergites have apical bands, not mentioned in the original description. The wings are very dark.

Halictus jucundus Smith.

Natal: a female from Weenan (*Thomasset*) has light reddish tegulae, as in Smith's type; but one from Greytown (*J. Ogilvie*) has the tegulae black, slightly reddish posteriorly. The bees appear to be otherwise the same, and the localities are not very far apart.

Halictus zimbabwicus Cockerell.

Natal: Van Reenen, Drakensberg, Dec. 1926 and Jan. 1927, many of each sex (*R. E. Turner*). The males generally have the abdomen olive green, but occasionally dark bluish. I am at present unable to separate these insects from *H. zimbabwicus*, described from S. Rhodesia. The male antennae are perhaps not quite so long, and the area of metathorax seems rather larger, but in the long series I cannot find definite characters suggesting a distinct species.

Halictus mesogonus sp. n.

♂. Length about 6 mm., anterior wing 4 mm.; black, rather slender, with dull white hair, dense on sides of face, and forming a rather inconspicuous patch on postscutellum; clypeus produced, entirely black; clypeus and supraclypeal area shining; antennae moderately long, the flagellum clear red beneath, except at base and apex; mesonotum and scutellum highly polished; area of metathorax densely plicate; tegulae red; wings hyaline, stigma large, dusky red, nervures pale brown; second submarginal cell broad, receiving recurrent nervure at apical corner; legs black, the tarsi reddish apically; abdomen long and rather narrow; first tergite highly polished, and with a patch of white hair on each side; second to fourth with narrow entire basal bands.

The microscope shows the clypeus to have coarse dense punctures, connected by little ridges; the area of metathorax coarsely sculptured, and pointed (angled) behind.

Katanga: Lubumbashi, 14 June, 1920 (*Michael Bequaert*). By the shining mesonotum, and the flagellum red beneath, this resembles the S. African *H. contracticaudus* Ckll., but this is larger, with longer antennae, and the clypeus has a yellow apical band. *H. uvirensis* Ckll. differs by the clypeus, antennae and other characters.

Halictus lubumbashicus sp. n.

♀. Length about 8·5 mm., anterior wing 6·5 mm.; black, robust, with scanty dull white hair, dense on postscutellum, long and conspicuous at sides of metathorax, but thin on face; mandibles and antennae black; head broad; clypeus and supraclypeal area polished, the clypeus projecting, with an apical pit; mesonotum dullish, not at all polished, but a little shining on disc; scutellum bigibbous, the elevations shining; area of metathorax rather large, dull and rugose, reticulate all over as seen under the microscope, the margins of the pits prominent; hind margin of mesonotum, before scutellum, with a narrow hair-band; tegulae very dark reddish; wings faintly dusky; stigma rather narrow, dark brown; nervures brown, outer nervures weakened; marginal cell narrow at apex; second submarginal cell very broad, receiving recurrent nervure at extreme apex; legs black, with the tarsi red at apex, the hind tarsi more distinctly reddish; abdomen with no patches of hair at sides of first tergite; second and following tergites with inconspicuous

hair-bands at base, enlarged at sides on second and third, the third has also a thin band before the apical depression.

KATANGA: Lubumbashi, 4 Jan., 1921 (type) and 8 Feb., 1921, collected by Dr. Michael Bequaert. Very much like *H. rubritarsis* Ckll., but with the marginal cell narrower at end, lower part of sides of face polished, nervures darker, etc. The area of metathorax is also distinctive. There is some resemblance to *H. mesopolitus* Ckll., from Tshibinda.

Halictus cardiurus sp. n.

♀. Length about 7 mm., anterior wing nearly 5 mm.; black, robust, with short broad (heart-shaped) abdomen; hair dull white, long at sides of face, on postscutellum forming a rather inconspicuous band; no hair-band bordering mesonotum; head broad; mandibles and antennae black, the flagellum very faintly brownish beneath; clypeus and supraclypeal area shining, but not very brilliant, clypeus with a median pit; lower part of sides of face not polished; mesonotum highly polished, a little duller in front, scutellum polished; area of metathorax short, appearing dull and granular under a lens, the microscope shows minute reticulation, with weak plicae at sides, and a raised hind rim; tegulae rather small, black; wings faintly dusky, stigma dark brown, nervures brown, outer nervures weakened; second submarginal cell broad, especially below, receiving recurrent nervure near apical corner; legs black, tarsi red at end, hind tarsi red; ninth spur with about six short teeth; abdomen shining; first tergite with no lateral hair patches; second with a spot of pale hair on each side at base; third with a short band at each side basally, or this may be wholly hidden; the general appearance of the abdomen suggests that it is bandless.

KATANGA: Lubumbashi. Three collected 8 April, 1921 (*M. Bequaert*). Smaller than *H. rubritarsis* Ckll., and easily separated by the shining mesonotum. *H. mesopolitus* Ckll. is allied, but has a different area of metathorax. *H. diloloensis* Ckll. differs by the dull supraclypeal area, the third spur, and other characters.

Halictus monozonus sp. n.

♀. Length about 9 mm., anterior wing 6 mm.; black, robust, conspicuously pubescent, the hair on sides of face and front dull white, on thorax yellowish, thin above, but dense on postscutellum; head large but rather oblong, clypeus prominent, the lower part highly polished, the upper part dull; there is a median groove; supraclypeal area shining; mandibles black; labrum with conspicuous pale hair; flagellum red beneath; mesonotum polished; scutellum shining, hairy; area of metathorax very short, without evident plicae as seen under a lens, but the microscope shows dense irregular vermiform rugae; tegulae red; wings hyaline, slightly reddish, stigma and nervures pale reddish; second submarginal cell broad; legs black, the tarsi reddened apically; hind spur with about six short teeth; abdomen robust, first tergite without lateral patches, second at base on each side with a patch of pale hair, third at base with a broad, even, ochreous-tinted band, fourth with an inconspicuous band, apex hairy. The broad hair-band across middle of abdomen is a very conspicuous feature.

KATANGA: Lubumbashi, 15 June, 1921 (*Michael Bequaert*). There is some resemblance to *H. mesopolitus* Ckll., but that differs in the abdomen and other respects. *H. diloloensis* Ckll. has the supraclypeal area dull, and dark brown stigma and nervures.

Halictus lubutinus sp. n.

♀. Length about 7 mm., anterior wing 6 mm.; black, including mandibles and antennae, but tegulae red; pale pubescence very thin on face and front, on thorax tinted

with ochraceous, and the postscutellum densely covered with bright ochraceous tomentum; clypeus dull, with the lower margin shining, supraclypeal area moderately shining; the clypeus has a large round pit just above the shining margin; mesonotum dull; scutellum shining, with a median groove; area of metathorax very finely and densely striate; wings faintly dusky, stigma and nervures light reddish; second submarginal cell rather broad, third short, hardly broader than second; first recurrent nervure interstitial; legs black, with reddish tarsi; abdomen shining; first tergite without lateral hair-patches; second and third with broad bands of dense pale ochreous tomentum, that on third broadest; third with a very weak subapical band. The area of metathorax, under the microscope, has a pitted appearance.

Belgian Congo: Lubutu, 0° 40′ S., 26° 40′ E., Jan.–Feb. 1915 (*J. Bequaert*). A second specimen, with head missing, is from Camp No. 3, Du River, Liberia. It differs by the very dark brown tegulae, and may be a distinct race.

This appears to be related to *H. monozonus* Ckll., but is considerably smaller, with dull mesonotum, and two conspicuous bands on abdomen. There is some resemblance to the S. African *H. trichardti* Ckll. and *H. acaciae* Ckll. The latter has the first tergite dull, not shining as in our species. The former has the hind tibiae red.

Halictus obscurifrons sp. n.

♂. Length about 8 mm., anterior wing 5·3 mm.; black, including clypeus and mandibles, the flagellum of the moderately long antennae obscurely brownish beneath; head circular seen from in front, but the clypeus conspicuously projecting; clypeus entirely dull, with a median subapical pit; supraclypeal area dull; sides of face with white hair; thorax with thin white hair, not conspicuous on postscutellum; mesonotum dull, shining along posterior margin; scutellum with the two elevations feebly shining; no marginal hair-bands on mesonotum; area of metathorax a narrow band, densely but obscurely plicate; tegulae very dark brown, almost black; wings hyaline, stigma and nervures pale brownish; second submarginal cell broad, especially below, receiving recurrent nervure some distance before end; third submarginal hardly wider than second; legs black, the tarsi red at end; abdomen with no patches of hair on first tergite; second to fourth tergites with basal bands of whitish tomentum, interrupted on second, not at all conspicuous.

Katanga: Lubumbashi, 10 July, 1920 (*Michael Bequaert*). Known from other Katanga species by the large dark tegulae and the dull mesonotum. In the table of Vachal species, it falls nearest to *H. atricans*. *H. michaelis* Ckll. has the area of metathorax with strong plicae.

Halictus beniensis sp. n.

♀. Length about 7·5 mm., anterior wing 5 mm.; black, robust, with white hair, rather conspicuous on sides of face and front, cheeks and top of head, densely fringing tubercles, forming a narrow band at base of postscutellum; head large, approximately circular seen from in front; mandibles and antennae black, the flagellum faintly brownish beneath; clypeus shining, with large punctures and a median groove; supraclypeal area shining; lower ends of sides of face polished; a highly polished spot just in front of ocelli; mesonotum polished, dullish anteriorly at sides; scutellum highly polished, a little depressed in middle; area of metathorax large, obtusely subangular behind, rugulose all over, with distinct plicae showing at base; tegulae large and black; wings hyaline, stigma rather large, dilute brown; nervures brown, outer nervures weakened; second submarginal cell broad, receiving recurrent nervure at apical corner; third submarginal not greatly broader

than second; legs black, the middle and hind tibiae with copious white hair; brush at end of hind basitarsi bright copper red; abdomen broad, shining; a rather obscure patch of white hair at each side of first tergite; tergites 2 to 5 with narrow entire basal bands of white tomentum; no trace of a second band on third, except a patch at extreme sides; venter with short white hair.

Belgian Congo: Kasindi to Beni, 29° 30′ E., 0° 30′ N., August 1914 (*J. Bequaert*). In some respects similar to *H. tanganus* Ckll., but that has the mesonotum dull and light reddish tegulae. Perhaps better compared with *H. mesopolitus* Ckll., but that has the scutellum dull and brownish wings.

Halictus kabaricus sp. n.

♀. Length about 7·3 mm., anterior wing about 5 mm.; black, moderately robust, with scanty white hair, conspicuous on sides of face, forming a dense band at base of postscutellum; mandibles and antennae black; head approximately circular seen from in front; clypeus projecting, it and the supraclypeal area shining, sides of face shining at lower end; mesonotum mainly dull, but moderately shining on disc; scutellum with two small shining eminences; area of metathorax plicate; tegulae dark chestnut red; wings dusky, stigma dark brown; nervures pale brown; second cubital cell broad, receiving recurrent nervure near apical corner; third submarginal not much broader than second; legs black, with the small joints of tarsi red; hind spur with three long spines and a fourth shorter one (style of *H. nialensis* Ckll.); abdomen shining, a small patch of white hair at each side of first tergite, narrow clear white hair-bands at bases of tergites 2 to 4.

Belgian Congo: Kabara, 0° 35′ S., 29° 30′ E., 31 Aug., 1914. The abdomen is like that of *H. beniensis* Ckll., which is, however, more robust, with polished mesonotum and black tegulae. It was collected by Dr. J. Bequaert.

H. lubumbashicus Ckll. is more robust, with the supraclypeal area polished. *H. lubutinus* Ckll. has the abdominal hair-bands and hair on postscutellum flavous.

Halictus lukulensis sp. n.

♂. Length about 7·6 mm., anterior wing 6 mm.; black, with the abdomen and scutellum shining, but mesonotum entirely dull, except along the posterior margin; head rather broad, not oval; clypeus shining, with strong scattered punctures, and a strong median groove; area between clypeus and eyes highly polished; supraclypeal area rather dull; front dull, moderately shining along orbits; top of head shining; labial palpi short and thick; maxillary palpi extremely long and filiform; mandibles black; antennae black, only moderately long for a male, flagellum submoniliform; area of metathorax shining, pointed behind, and with very strong plicae; tegulae black; wings very faintly dusky; stigma dark reddish, nervures dark brown, all distinct; second submarginal cell rather narrow, parallel-sided, receiving recurrent nervure at extreme apex; third submarginal hardly produced at end; legs entirely dark, except that the tarsi are reddish at extreme apex; abdomen without bands, but small spots of white tomentum at lateral bases of second and third tergites; apex of abdomen with a pair of widely separated lobes.

Belgian Congo: Lukula, 1 Sept., 1913 (*J. Bequaert*). In the peculiar mouth-parts this resembles *H. filiferellus* Ckll., but it is quite different in the sculpture of the thorax, and other characters. From *H. stanleyi* Ckll. it is known by the entirely black clypeus, and many other characters.

A female, with exactly the same data, is larger and more robust. It has the same area of metathorax, and in general agrees so well that one cannot doubt the association, although the abdominal tergites have an entire white

basal band of tomentum on third, on second a broken band reduced to two cuneiform marks, on fourth a narrow almost entire band. The mouth-parts are extended and show the tongue with a very long filiform extension, characteristic of *Oxyhalictus*. The hind spur is not pectinate. This female *H. lukulensis* may be compared with *H. nairobicus* Ckll., but it has no slender hair-band along hind margin of mesonotum, and the area of metathorax and hind spurs differs. There is also a female *H. lukulensis* from Walikale, Belgian Congo, 1° 25′ S., 28° E., 7 Jan., 1915 (*J. Bequaert*).

Halictus sellatiferus sp. n.

♂. Length about 6 mm., anterior wing 4·3 mm.; shining black, the mesonotum and scutellum highly polished; clypeus with a deep and broad median groove; antennae very short for a male, flagellum thick; tegulae small and black; wings very faintly dusky. Nearly agrees with the description of *H. pulchrinitens* Ckll., from the Orange Free State, differing thus: tarsi clear light red; saddle of pubescence on base of second tergite white; no patches of hair on third tergite. The second submarginal cell is broad, and receives the recurrent nervure at its apical corner. The head is quite broad, with the clypeus entirely black.

Belgian Congo: Lubumbashi, Katanga, 14 June, 1920 (*Michael Bequaert*). This is much larger than *H. microsellatus* Ckll., and the saddle on second tergite is shorter.

Halictus bogoroensis sp. n.

♀. Length about 11 mm., anterior wing 7·3 mm.; black, including mandibles and antennae, but tegulae rather light red, and hind tarsi red; pubescence greyish-white; head rather broad, with much white hair at sides of face and front; clypeus moderately shining, punctured, with a strong median pit; supraclypeal area dullish, not at all polished; mesonotum hairy, slightly shining, with a median groove; scutellum and postscutellum hairy; area of metathorax short, dull and rugose, a little plicate at sides; posterior truncation hairy; wings dusky hyaline; stigma red; nervures brown; second submarginal cell very broad, receiving recurrent nervure at the apical corner; outer side of third submarginal bulging outward, without a double curve; hind coxae and trochanters large; hind spur not pectinate; first tergite of abdomen with long hair at base and sides; second with a large cuneiform patch at each side basally; third with an entire band, narrowed in middle; fourth with a band, only visible at sides; apex with pale hair.

Belgian Congo: Bogoro, 7 July, 1914 (*J. Bequaert*). Apparently related to *H. subpatricius* Strand and *H. fuliginosus* Ckll., but distinguished by the abundant pale hair and other characters.

Halictus taurinus sp. n.

♀. Length about 6·2 mm., anterior wing 4·5 mm.; black, with scanty dull white hair, not forming a patch on postscutellum; the face and front appear thinly hoary; head very broad; mandibles and antennae black, the flagellum obscure brown beneath; clypeus short and broad, it and the supraclypeal area moderately shining; mesonotum and scutellum dull; area of metathorax appearing dull and rough under a lens, but the microscope shows a finely reticulated surface, the elevated margins of the reticulations shining; tegulae very small, very dark brown; wings faintly dusky, stigma large, dark brown; nervures brown, outer nervures not weakened; marginal cell unusually deep and short; second submarginal cell broad (nearly as broad as third), receiving recurrent nervure near apical corner; tarsi obscurely reddish, hind tarsi with shining golden hair; abdomen broad, polished, with no conspicuous hair spots or bands, but third and following tergites with obscure greyish-white hair.

KATANGA : Lubumbashi, 7 Jan., 1921 (*Michael Bequaert*). This falls next to *H. brevissimus* Ckll., from which it is easily known by the small tegulae, entirely dull mesonotum, and the shape of the abdomen, which is of ordinary form. The very broad front and the red hind tarsi are also distinctive.

Halictus katangiellus sp. n.

♀. Length nearly 6 mm., anterior wing a little over 4 mm.; black, with scanty pale hair, forming a patch on postscutellum; mandibles and antennae black, the apical part of flagellum dusky reddish beneath; head broad, but not extremely so; clypeus, supraclypeal area and sides of face shining; mesonotum dull, slightly shining; scutellum polished; area of metathorax large, shining, not evidently sculptured as seen under a lens, but the microscope shows delicate irregular plicae; tegulae small, dark brown; wings faintly dusky; stigma and nervures pale brown, outer nervures weakened; second submarginal cell small, rather narrow; first recurrent nervure interstitial; legs black; abdomen ordinary, shining, without hair-bands or spots; hind margin of fourth tergite narrowly pale and shining.

KATANGA : Lubumbashi, 22 March, 1921 (*Michael Bequaert*). There are several small species from Lubumbashi, superficially alike, but on closer examination separating as follows :—

	Mesonotum polished on disc; flagellum red beneath; male .	*mesogonus* Ckll.
	Mesonotum not polished on disc	1.
1.	Scutellum not polished	2.
	Scutellum polished	3.
2.	Mesonotum somewhat shining; tegulae large	*brevissimus* Ckll.
	Mesonotum entirely dull; tegulae small; front very broad .	*taurifrons* Ckll.
3.	Face and front hoary; tegulae brown	*katangiellus* Ckll.
	Face and front not hoary; tegulae black	*epichlorops* Ckll.

The last has the abdomen greenish, which is not at all the case with the others.

Halictus brevissimus sp. n.

♀. Length about 6 mm., anterior wing 4·3 mm.; black, with thin dull white hair, not forming a dense patch on postscutellum; mandibles and antennae black; head broad, clypeus shining, with coarse punctures; supraclypeal area moderately shining; mesonotum shining, but not polished; scutellum dullish, weakly shining on disc; area of metathorax dull and rugose, as seen under a lens, but the microscope shows fine dense parallel plicae, with the intervals shining, and in the middle the plicae form a minute reticulation; tegulae very dark brown, almost black; wings faintly greyish; stigma pale dull reddish; nervures pale brown, outer nervures weakened; second submarginal cell small, receiving recurrent nervure near end; third submarginal much broader than second; legs black; hind spur with about six small teeth; tarsi reddish apically; abdomen very broad and short, with inconspicuous bands of dull white hair at bases of third and fourth tergites.

KATANGA : Lubumbashi, 27 Jan., 1921 (*Michael Bequaert*). Among the small Katanga species distinguished by the absence of any greenish tint, the mesonotum not polished, the scutellum not polished, and the tegulae large. The South African *H. latior* Ckll., with broad abdomen, is much larger and otherwise different. It may also be compared with *H. niveostictus* Ckll., differing in the antennae, the stigma, and the marking of the abdomen. *H. diloloensis* Ckll. is also allied, but has the flagellum red beneath.

AN APPARENTLY NEW *MARGARODES* (COCCOIDEA) INJURIOUS TO GRASS LAWNS IN THE NORTHERN SUDAN

By W. J. Hall, D.Sc., F.R.E.S.

(*Imperial Institute of Entomology.*)

Margarodes aureliana sp. n. (figs. 1–17).

Cysts hard, golden and varying from very broadly oval to spherical in shape. Although abundant spirit material was available for examination, all the adult females found were enclosed within their cysts.

Adult Female.

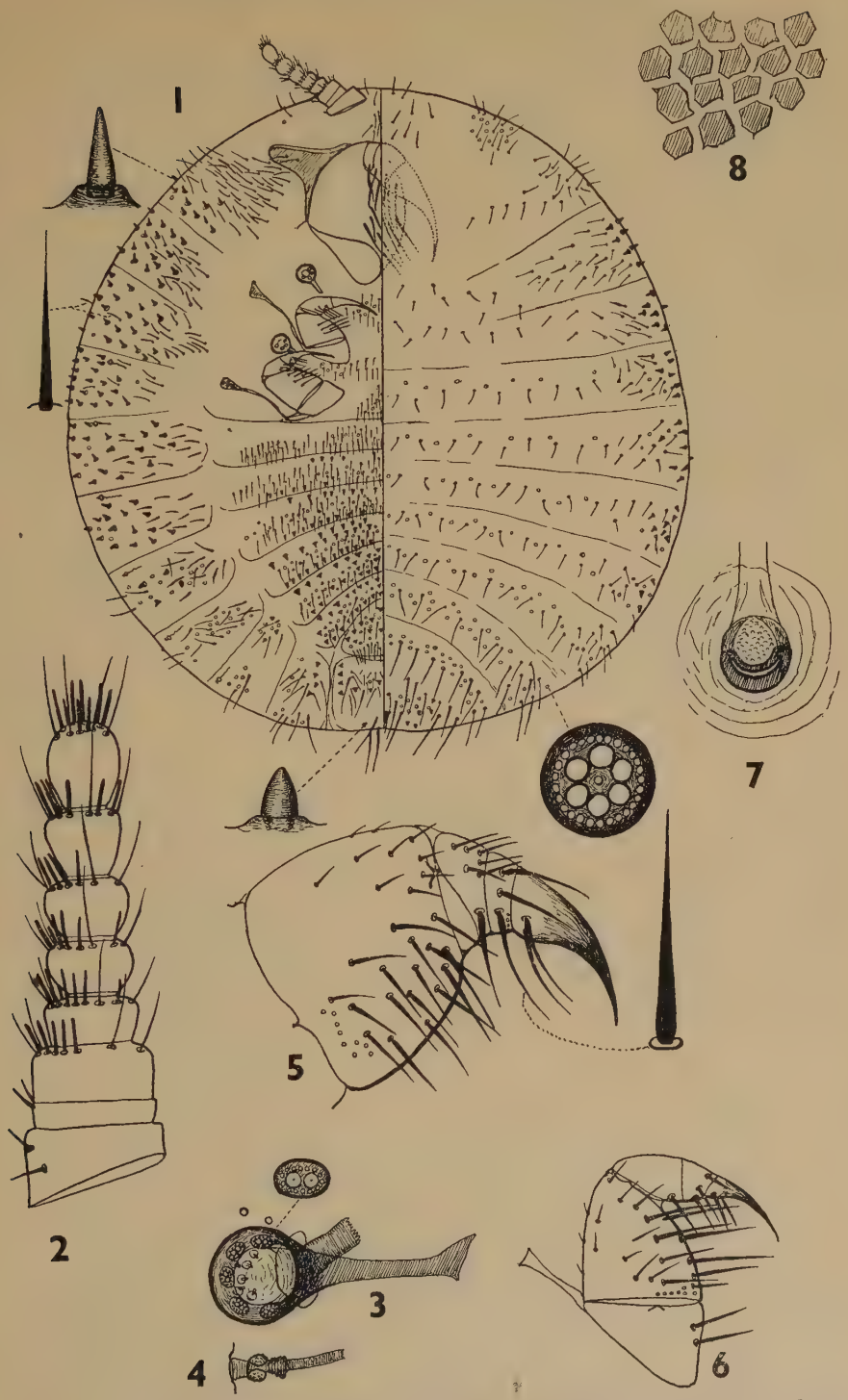
Body of adult female (fig. 1) creamy white and very broadly oval to circular when mounted; dermis membranous. Antennae of 8 segments (fig. 2), relatively short and stout but gradually tapering from the basal to the terminal segment. The second segment is markedly shorter than the others and has the appearance of having been cut off from the base of the third; the terminal segment is the longest and bulbous in shape. All segments, with the exception of the terminal segment, wider than long. The apex of the terminal segment carries a few setae with shorter and stouter, bluntly pointed, sensory setae interspersed; a whorl of similar fine setae and sensory setae occurs at the distal extremity of segments 7 to 3.

Limbs of the type normal to the genus. Forelimbs much enlarged (fig. 5), the articulations separating the claw, tarsus and tibia not flexible but indicated by faint sutures, the articulation between the tibia and much swollen femur well developed and functional. Coxae not clearly differentiated. Inner aspects of all joints with long stout setae that are clearly constricted at their bases. Two such setae also arise from the base of the claw but do not extend beyond the apex and presumably represent the claw digitules. Some scattered shorter setae are found dorsally. Usually four small translucent pores occur near the distal extremity of the tarsus on its inner surface and a series of 9 or 10 similar pores are found at the base of the femur, again on the inner surface. Claw very strongly developed and highly sclerotised. Mid and hind limbs (fig. 6) similar to the forelimbs but very much smaller; the coxae are apparent in most examples but the translucent pores on the tarsus appear to be lacking.

Thoracic spiracles (fig. 3) of moderate size with a well-developed bar; the opening is circular and five large oval pores occur in a ring just within the orifice; these pores have two large loculi enclosed within a ring of minute loculi; associated with these pores are 4 to 6 much smaller pores with minute tubular ducts and on the dermis just outside the thoracic orifice are two very small circular pores or setae.

Abdominal spiracles (fig. 4) very much smaller than the thoracic spiracles, in six pairs on the anterior abdominal segments; one to four large pores are present, set a little way in from the orifice, and also some very much smaller and inconspicuous circular pores.

The dermis exhibits a loose irregularly polygonal structure (fig. 8), each polygonal unit being flatly convex, and at the margin presents a minutely corrugated outline. Ventral dermis, and dorsal dermis submarginally, clothed with spines and moderately long, rather stout, setae. The setae have no noticeable constriction at the base as have those on the limbs; the spines are short and stout with bluntly rounded tips anteriorly but towards the posterior extremity they become shorter and broader at the base, assuming a conical shape. Each spine is set on a low rounded sclerotised tubercle. On the medioventral area of the abdominal segments the setae are arranged in transverse series with the setae lying parallel



FIGS. 1–8.—*Margarodes aureliana* sp. n. Adult ♀: 1, Body; 2, Antenna; 3, Thoracic spiracle; 4, Abdominal spiracle; 5, Forelimb; 6, Hindlimb; 7, Anal orifice; 8, Portion of dermis.

and all directed posteriorly; they become successively longer towards the posterior extremity. The spines occur in loose transverse series on each segment posterior to the transverse line of setae and, on the posterior segments, a smaller series also is found anterior to it. The spines increase in number on the posterior abdominal segments but become successively shorter and more conical in form. The marginal and submarginal areas of all segments, both ventrally and dorsally, clothed with large groups of similar setae and spines; the greatest development of the spines is laterally of the anterior abdominal and metathoracic segments; on the posterior abdominal segments the number is much reduced. The greatest development of setae is in the group anterior of the anterior thoracic spiracles, where the spines are few; posterior to this group the spines are more and the setae less numerous but on the posterior abdominal segments, although both spines and setae are relatively few, the reverse is the case. The dorsal dermis with transverse rows of rather widely separated setae on all segments. Both dorsal and ventral dermis with scattered rather large disc pores; these are most numerous on the posterior abdominal segments, where they are arranged in transverse series; the pores have 4 to 6 loculi encircled by a chain of minute loculi; the usual number of loculi is 5 or 6; in only very few instances have as few as 4 been seen.

Mouthparts wanting and anal orifice (fig. 7) small but clearly visible.

Length of adult female 2·5–3·0 mm.; breadth, 2·0–2·5 mm.

Praeadult or Second Stage Female.

Praeadult female, removed from the enclosing layers of the cyst, a pale amber colour and spherical or very broadly oval in shape (fig. 9). When prepared for microscopic examination the dermis is seen to be moderately sclerotised and with innumerable excessively minute, evenly distributed, translucent pores giving a stippled effect. Mouthparts well developed. Antennae (fig. 10) represented by two small hollow tubercles, from the centre of each of which arises a single stout bluntly pointed seta about one and a half times its length.

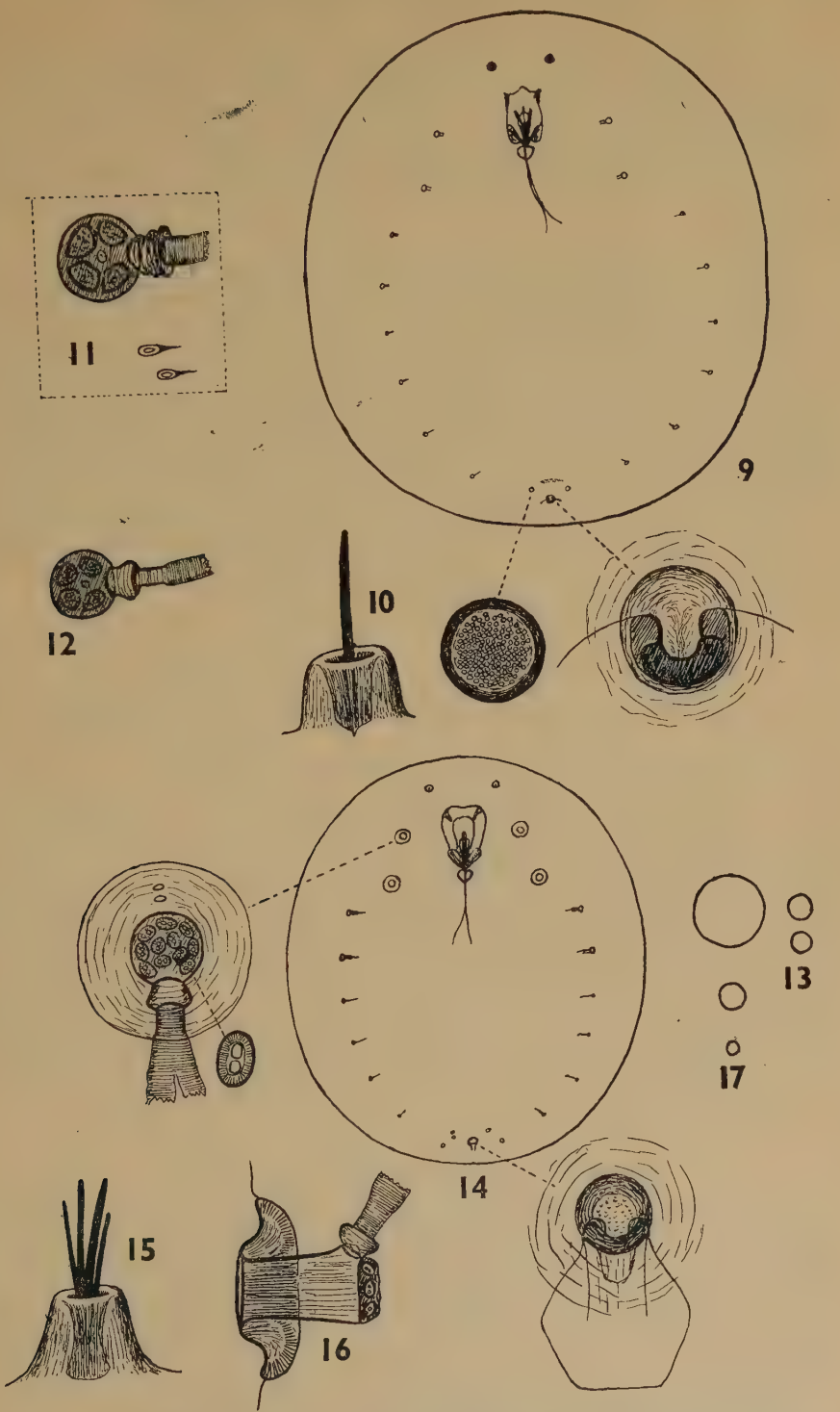
Thoracic spiracles (fig. 11) small, consisting of a cylinder with circular exterior orifice; the length of the cylinder is twice its diameter and at its base it carries four pores of uncertain inner structure. Associated with the orifice of each spiracle, but situated at some little distance from it, are two minute paddle-shaped structures (fig. 11). Abdominal spiracles (fig. 12) six on either side, of uniform size about $\frac{3}{4}$ that of the thoracic pair but of similar structure.

Anal orifice small but clearly visible, with a small circular cicatrix, having a minutely areolated centre, on either side and in some examples a smaller one anterior to it as well; these may be duplicated and in one example all three were duplicated. Other cicatrices apparently wanting.

First Stage Female.

First stage female similar in shape (fig. 14) to the praeadult female but smaller and milky white when its covering layers have been removed. Dermis membranous or only very slightly sclerotised, the minute translucent pores present but not showing up clearly. Mouthparts well developed. Antennae (fig. 15) as in the praeadult female but carrying from two to five bluntly pointed setae.

Thoracic spiracles (fig. 16) large and conspicuous, of the same general structure as those of the praeadult female; the diameter of the orifice is 2·5 times as great and has about a dozen crowded bilocular oval pores at the inner base. A well-defined zone around the orifice is strongly sclerotised, and this makes them appear even larger; two minute oval pores occur within this zone. Abdominal spiracles in six pairs, those on the two anterior segments being nearly twice the size of those on the other four segments but only two-fifths that of the thoracic spiracles. The two anterior pairs of abdominal spiracles carry



FIGS. 9–17.—*Margarodes aureliana* sp. n. Praeadult ♀: 9, Body; 10, Antenna; 11, Thoracic spiracle; 12, Abdominal spiracle; 13, Relative sizes of thoracic and abdominal spiracles. 1st stage ♀: 14, Body; 15, Antenna; 16, Thoracic spiracle—side view; 17, Relative sizes of thoracic, anterior and posterior abdominal spiracles.

pores but these appear to be entirely lacking in the posterior pairs of smaller spiracles. The relative sizes of the thoracic anterior and posterior abdominal spiracles of the 1st stage female, side by side with those of the thoracic and abdominal spiracles of the praeadult female, are shown in figs. 17 and 13.

Anal orifice similar to that of the praeadult female, but there are two pairs of cicatrices associated with it and in some examples one or other of the cicatrices is duplicated.

Larva.

Not seen.

On *Cynodon dactylon* (roots), SUDAN : Atbara (*Chief Engineer*), Aug. 1939, No. C.21631; Atbara (*Abdalla Hassan*), 12.viii.1939; No. C.21632; Atbara (*W. P. L. Cameron*), 22.iii.1945.

Said to cause serious damage to grass lawns, particularly tennis courts, at Atbara.

M. aureliana is closely related to *M. papillosus* Green described from India but the derm pores have consistently from 4 to 6 loculi and not 2 as in *papillosus*, the dermal spines are of more regular shape, less crowded laterally and not springing from well-defined polygonal cells. It also bears a strong superficial resemblance to *M. salisburiensis* Hall from S. Rhodesia, but differs from it in the derm pores not being multilocular, the more pointed dermal spines, six instead of seven pairs of definitely smaller and less conspicuous abdominal spiracles, and shorter dermal setae.

NEW SPECIES OF ORIENTAL STAPHYLINIDAE (COL.)

By Malcolm CAMERON, M.B., R.N., F.R.E.S.

Eleusis preangeranus sp. n.

Shining, head and thorax black, elytra brownish-yellow infuscate behind, abdomen reddish. Antennae and legs red. Length 6 mm.

Near *magniceps* Cam. Very similar in colour but with the antennae longer, the penultimate segments not transverse; head scarcely longer than broad, a little broader than in *magniceps*, the eyes more prominent, the post-ocular region less parallel, very feebly rounded, the ground sculpture uniform and much more distinct, the puncturation not so fine and closer; thorax scarcely differing in build, on each side of the fine median sulcus posteriorly with a space devoid of ground sculpture and punctures, elsewhere with more evident ground sculpture and punctures than in *magniceps*; the ground sculpture of the elytra is uniform and the punctures less fine than in that species.

JAVA : Preanger; G. Patoeha (*Drescher*). Type in my collection.

Priochirus (Plastus) jacobsoni sp. n.

Near *sikkimensis* Cam. but larger (12 mm.) and more robust, the frontal horns shorter, projecting but little beyond the anterior margin, the subcornual denticle larger, the frontal impression much shorter and broader, the anterior margin broadly arcuate, antennae stouter but similarly constructed; thorax similar in shape but with a pair of foveae on the disc, the puncturation of the sides coarser, elytra without lateral impression, in all other respects like *sikkimensis*. It is possible that *sikkimensis* may be identical with *ascendens* Fauv.

JAVA : Preanger; G. Patoeha. Type in my collection.

Priochirus (Plastus) javanus sp. n.

Allied to *brachycerus* Kr. but larger and more robust (length 12 mm.), the frontal impression shorter and broader, thorax more convex without discal foveae, the sides more punctured, bases of the tergites less punctured. In size and build more like *jacobsoni* Cam. but with longer frontal horns, the thorax without foveae on the disc.

JAVA: Preanger; G. Tangkoeban Prahoe, alt. 4000–5000 feet, 19–31.i.1933 (*Drescher*). Type in my collection.

Priochirus (Plastus) alienus sp. n.

Size and build of *currani* Bernh. but differing as follows: the frontal impression is shorter and broader, nearly three times broader than long, the inner teeth smaller, more widely separated by a broader and shallower emargination, rather more widely separated from each other than from the horns; thorax a little more narrowed towards the front, the sides with more numerous punctures and a row against the lateral margin itself, the posterior half punctured, whereas in *currani* this area is impunctate as is also the whole area adjacent to the lateral margin. The 1st segment of the antennae is not sulcate and in all other respects resembling *currani*. Length 10 mm.

JAVA: without further indication. Unique. In my collection.

Pseudolispinodes (?) paradoxus sp. n.

Moderately shining, yellowish-red, at the apex of each elytron with a yellow spot separated from the rest of the surface by a narrow sinuate blackish band. Antennae and legs reddish-yellow. Length 1·75 mm.

Parallel; head narrower than the thorax, the eyes rather large but not prominent, the clypeus truncate in front and separated behind from the rest of the surface by a curved impressed line between the antennal tubercles, the whole surface coriaceous, the clypeus impunctate, elsewhere with a few small obsolete punctures. Antennae short, the 1st segment short and stout, 3rd as long as but narrower than the 2nd, 4th to 6th moniliform, 7th transverse, 8th to 10th increasing in width and forming a club with the short oval 11th, the 9th and 10th about twice as broad as long. Thorax a half broader than long, the sides gently rounded, before the base sinuately retracted, the posterior angles rectangular, near them with a rather large rounded fossa, on the disc with two sulci converging towards the front and meeting at the anterior border, coriaceous with a few obsolete punctures. Elytra slightly broader and a half longer than the thorax, as long as broad, the sutural stria distinct, the humeral ill-defined and only reaching the middle, very finely longitudinally striate and impunctate. Abdomen cylindrical, the sides of the first four visible tergites each with two or three fine oblique striae, less strongly coriaceous than the fore-parts. It is probable that a new genus will be required for this species.

SUMATRA: Fort de Kock. Unique. My collection.

Espeson (Parespeson) lombokianus sp. n.

Shining, light red. Antennae and legs reddish-yellow. Length 2 mm. Head scarcely narrower than the thorax, the eyes moderate, not prominent, about as long as the rounded post-ocular region, between the eyes with a pair of large punctures, elsewhere with some smaller scattered punctures of varying size except in front; ground sculpture very feeble. Antennae stout, the 3rd segment a little longer than the 2nd, 4th and 5th moniliform, 6th transverse, 7th much broader, 8th transverse but narrower than the 7th, 9th and 10th as broad as the 7th, nearly three times broader than long. Thorax transverse

(3 : 2·5), the sides nearly straight and gently retracted backwards for the anterior two-thirds, then strongly strangulate before the base and there deeply foveate, except towards the anterior angles and in the foveae, covered with rather large and moderately close punctures; ground sculpture very weak. Elytra broader and longer (4 : 2·5) than the thorax, as long as broad, the sculpture very similar. Abdomen feebly coriaceous and with rather large, moderately close, superficial punctures.

Lombok : Sapit, altitude 2000 m., iv.1896 (*H. Fruhstorfer*). Unique. My collection.

Trogophloeus (s.str.) **terminalis** sp. n.

Black, head and thorax rather dull, elytra and abdomen more shining. Antennae with the 1st segment reddish-yellow, the 9th to 11th reddish, the rest black. Legs reddish-yellow. Length 2 mm.

Somewhat similar to *simplex* Motsch., of the same colour and lustre, but more robust, the eyes much smaller, antennae much shorter and stouter, thorax more dilated in front, the sides straightly retracted behind, sculpture of the fore-parts coarser. Head narrower than the thorax, the eyes moderate, the post-ocular region rounded and a little dilated, longitudinally bi-impressed in front, closely, finely and roughly punctured. Antennae with the 3rd segment as long as 2nd, 4th as long as broad, 5th and 6th slightly longer than broad, 7th as long as broad, 8th slightly, 9th and 10th more strongly transverse. Thorax transverse (1·75 : 1·3), the sides rounded and dilated in front, rather strongly and straightly retracted behind, before the scutellum with two small obsolete impressions, finely, closely and roughly punctured like the head. Elytra longer (1·75 : 1·3) and broader than the thorax, rather coarsely and closely punctured. Abdomen finely coriaceous, extremely finely, moderately closely punctured and with rather long greyish pubescence.

Java : Mt. Gede, altitude 8000 feet, viii.1892 (*Fruhstorfer*). Unique. My collection.

Trogophloeus (Boopinus) rufoniger sp. n.

Shining; head and abdomen black, thorax and elytra dark red, the disc of the former extensively black. Antennae brown, the first three or four segments and legs reddish-yellow. Length 3 mm.

Resembles *indicus* Kr. in the sides of the thorax being strongly rounded and dilated in front and strongly retracted behind. Head broad but narrower than the thorax, the eyes large and prominent, occupying nearly the whole side, longitudinally impressed on each side internal to the antennal tubercles, these punctured, otherwise impunctate and without ground sculpture. Antennae rather long, the 4th to 9th segments all longer than broad, decreasing in length, the 10th about as long as broad. Thorax transverse (2·5 : 1·75), the sides strongly rounded and dilated in front, strongly retracted behind (more so than in *indicus*), the disc with the usual four impressions and with a little keel before the scutellum, in the middle in front with a small obsolete impression and at the sides broadly superficially impressed, the whole disc impunctate, only at the sides with close somewhat rugose sculpture; ground sculpture absent. Elytra longer (2·5 : 1·75) than the thorax, broader than long, closely and deeply punctured. Abdomen finely coriaceous, very finely, moderately closely punctured. The whole insect with a long, greyish outstanding pubescence.

Java : Tji Solak. Type in my collection.

Trogophloeus (Boopinus) nigrorufus sp. n.

Very shining, head and abdomen black, the last tergite reddish-yellow, thorax and elytra dark red. Antennae brown, the first two segments and legs reddish-yellow. Length 3 mm.

In size and build very like *rufoniger* Cam. but more shining, the antennae similarly constructed, the head not quite so broad, practically impunctate, the thorax not so strongly dilated in front, with the usual four impressions on the disc, but without impression in the middle line in front, at the sides less strongly impressed, the disc practically impunctate, at the sides with large close punctures, larger than in *rufoniger*, elytra with much coarser and less close puncturation than in that species. Abdomen extremely finely and very sparingly punctured. The whole insect without ground sculpture and with a long greyish outstanding pubescence.

JAVA : Tji Solak; Wynkoopsbaal (Grelak). Unique. My collection.

Trogophloeus (Boopinus) pallidicornis sp. n.

Moderately shining, head and abdomen black, thorax and elytra red. Antennae yellowish-red, the first two segments and legs reddish-yellow. Length 2·3 mm.

Build and lustre of *oculatus* Woll., the antennae similarly constructed, but a little smaller and narrower, differently coloured, the eyes larger. The sculpture of the head is similar, the four discal impressions of the thorax more marked, the puncturation closer and finer than in that species, the elytra a little more closely and more finely punctured than in *oculatus*, but the abdomen similar.

JAVA : Tji Solak. Type in my collection.

Trogophloeus (Taenosoma) megacephalus sp. n.

Rather shining; head darker, thorax lighter reddish-brown, the clypeus yellow; abdomen pitchy black. Antennae reddish, the first three segments and legs reddish-yellow. Length 1·75 mm.

Near *foveicollis* Kr., of similar lustre, but with the head differently shaped, different antennae, narrower thorax and smaller eyes. Head transverse, subquadrate, as broad as the thorax, the post-ocular region longer than the eye, the puncturation finer than in *foveicollis*. Antennae with the 2nd segment stout, as broad as long, 3rd narrower, obconical, 4th to 8th transverse, increasing in width, the 9th and 10th yet more strongly transverse, forming with the 11th a distinct club. Thorax transverse (2·75 : 2), the sides straight behind and a little retracted, the disc with a pair of fossae extending forwards to the middle, the puncturation as close but finer than in *foveicollis*. Elytra longer (3 : 2) and broader than the thorax, as closely but more finely punctured than in that species. Abdomen finely coriaceous and practically impunctate, the pubescence scanty.

JAVA : Buitenzorg. At light (*A. M. Lea*). Co-type in my collection.

Oxytelus (Caccoporus) fruhstorferi sp. n.

Colour and lustre of *ferrugineus* Kr., but larger (4 mm.) and more robust, the antennae stouter, only the first three segments reddish-yellow, the 4th larger, more transverse, the penultimate broader. Head a little narrower than the thorax, subtriangular, the eyes large and prominent, occupying the whole side, the frontal margin rounded, the clypeus coriaceous but shining, at the middle of the base with a distinct sulcus, the punctures coarser and closer than in *ferrugineus*. Thorax formed as in that species, with similar sulci but more impressed at the sides, the punctures larger; the elytra more coarsely punctate-striate; the abdomen as in that species.

♂. Unknown.

E. JAVA : Pengalengan, altitude 4000 feet, 1893 (*H. Fruhstorfer*). Unique. In my collection.

Oxytelus (Anotylus) fusciventris sp. n.

Shining; head dark reddish-brown, yellow-red in front, thorax yellowish-red, elytra yellow, abdomen pitchy. Antennae reddish, the first five segments and legs reddish-yellow. Length 2·5 mm.

In size, colour and lustre very similar to *migrator* Fauv. but with the 1st segment of the antennae clavate, the eyes much smaller, the post-ocular region well developed, the punctures on the head much larger, thorax shorter, more transverse, the sides evenly rounded with the base, the sculpture, however, scarcely differing, elytra with coarser puncturation less distinctly striate. Head transverse, a little narrower than the thorax, the eyes moderate, a little longer than the completely rounded post-ocular region; frontal margin truncate, the clypeus convex with four or five small punctures and separated by a semi-circular groove from the rest of the surface; against the eye with a sulcus, the disc without impressions and with moderate rather sparing punctures; thorax transverse (4·3 : 3·2), the sides gently rounded and coarctate with the base, with narrow entire median sulcus and very obsolete lateral ones, towards the sides slightly impressed, on the disc with larger and smaller punctures, some elongate and coalescing, at the sides much more coarsely and closely punctured. Elytra longer than the thorax (4 : 3·2), coarsely and closely punctured, scarcely striate except at the sides. Abdomen feebly coriaceous, nearly impunctate. The fore-parts without ground-sculpture. The antennae except for the 1st segment formed as in *migrator*, the 4th segment small, the 5th to 10th strongly transverse. The two examples have the last sternite a little produced and rounded in the middle.

Sambawa: B. Aroe Hassa, altitude 2000–2500 feet (*Doherty*). Buitenzorg (*Lea*). Type in my collection.

Oxytelus (Anotylus) glaber sp. n.

Reddish-yellow, shining, the elytra scarcely infuscate posteriorly. Antennae and legs reddish-yellow. Length 2 mm.

Near *hostilis* Bernh., of the same colour and build except that the elytra are shorter and the eyes smaller, the post-ocular region longer. ♂ (?) head as broad as the thorax, the eyes very small, the post-ocular region rounded and widened, between the eyes finely coriaceous, elsewhere without sculpture. Antennae with the penultimate segments rather more transverse than in *hostilis*. Thorax transverse (3·2 : 2·2), trapezoidal, the sides slightly sinuate and retracted behind, with well-marked median sulcus, the lateral shorter, broader and less deep, towards the sides lightly impressed and with a few rather coarse punctures. Elytra only as long as the thorax, rather coarsely, more or less longitudinally striate, impunctate. Abdomen practically impunctate. The whole insect without ground sculpture except between the eyes. The sternites present no special characters.

Sumatra: Fort de Kock (*Jacobson*). Unique. My collection.

Osorius javanus sp. n.

Near *aspericeps* Fauv. (*crenulatus* Cam.) but smaller (7–8 mm.), the frontal margin truncate and less distinctly crenulate, the head with rather broad smooth space along the middle, the rugae at the sides weaker; thorax with the sides in front gently rounded, not practically straight as in *aspericeps*, but the puncturation very similar; the elytra are much more strongly and uniformly punctured than in that species.

W. Java: Sukabumi; E. Java: Mt. Tengger (*Fruhstorfer*). Type in my collection.

Osorius niasianus sp. n.

Near *frontalis* Fauv., of the same build and colour but a little larger (6 mm.) and more robust; the anterior margin of the front similar, the head without ground sculpture, the

anterior half with small, more or less circular feeble impressions sparingly distributed, posteriorly with rather broad smooth median area, on each side with coarse elongate impressions separated by irregular rugae; thorax formed as in *frontalis*, the punctures rather larger, along the middle with a smooth space as in that species; elytra much as in *frontalis* but the abdomen less punctured.

CENTRAL NIAS : Lahago (*Kannengieter*). A single specimen in my collection.

Osorius sumatrensis sp. n.

Very near *rufipes* Motsch., but with the thorax formed as in *cribrum* Bernh. and differing from *rufipes* in the following respects : the declivous part of the front is entirely covered with striae and fine scarcely interrupted rugae, the rugae between the eyes finer, the thorax and elytra much more finely and obsoletely punctured, the abdomen also more finely punctured.

SUMATRA : Fort de Kock.

Osorius rugiventris sp. n.

Shining ferruginous red, the head between the eyes and the elytra posteriorly more or less infuscate. Antennae and legs reddish-yellow. Length 4·5 mm.

Size and build of *rufipes* Motsch., the antennae similarly constructed, but with broader frontal margin, the rugae of the declivous part finer and more obsolete, punctures absent, between the eyes with much finer interrupted obsolescent rugae, a space on the vertex without sculpture; punctures of thorax finer, more obsolete, scarcely as close; elytra with sparing obsolete punctures; abdomen with rather coarse close longitudinal rugae very different from the usual sculpture of the genus. The whole insect without ground sculpture.

SUMATRA : Fort de Kock (*Jacobson*). Unique. My collection.

Osorius tuberculifrons sp. n.

Build and colour of *collaris* Bernh., but much smaller (6 mm.) and narrower, the median tubercle on the frontal margin more developed, the rugae on the declivous front weaker and fewer; sculpture of the thorax very similar in character to that of *collaris* but finer, the granules less elongate, that of the elytra and abdomen scarcely differing in the two species.

JAVA : Tjibodas. Unique. In my collection.

Osorius sumatranus sp. n.

Size and build of the preceding, but the frontal margin without tubercle, the rugae of the declivous front limited to the anterior half, elsewhere with a few small granules, the sculpture of the thorax similar in character but finer and less close, that of the elytra and abdomen scarcely differing in the two species.

SUMATRA : Wai Lima. Unique. In my collection.

Osorius pendleburyi sp. n.

Very near *tuberculifrons* Cam. and only differing in the following respects : the rugae of the anterior part of the front are interrupted, forming elongate granules, the sculpture of the thorax coarser and closer, distinctly granular, the punctures of the elytra smaller and less superficial.

PERAK : Larut Hills, altitude 3700–4500 feet (*H. M. Pendlebury*). Unique. In my collection.

NOTES ON THE DISTRIBUTION OF AFRICAN CYRTACANTHACRINAE (ORTHOPTERA, ACRIDIDAE)

By K. H. Chapman, M.A., F.R.E.S.

(*Lecturer in Zoology, Rhodes University College, Grahamstown, South Africa.*)

1. *Anacridium moestum* (Serv.).

Uvarov (1923) decided that *Anacridium melanorhodon* (Wlk.) was not a true species, and reduced it in rank to a subspecies of *A. moestum* (Serv.). He gave the geographic distribution of *A. m. moestum* (Serv.) as " distributed all over South Africa, ranging northwards up to North Uganda (Gondokoro) and Northern Nigeria (Zunguru, B.M.)," adding that it had never been recorded from the Central and West African forest regions, which it does not seem to penetrate (*loc. cit.* : 488). The distribution of *A. m. melanorhodon* (Wlk.), originally described by Walker from material from the Cape Verde Isles, according to Uvarov (*loc. cit.*), is given as " St. Vincent, Cape Verde Islands; Khartum; Massowah; Aden and Sokotra "; and Uvarov adds that Karny's " *A. sphalera* " and Finot's " *A. aethiopica*," now synonyms of *A. m. melanorhodon*, were described from Renk, Sudan, and from Abyssinia, respectively.

Now the specimens of *A. m. moestum* in the South African Museum, Capetown, which I examined in January 1944, are from the following localities :— South-West Africa (Swakopmund, Omararu); Transvaal (Potchefstroom); North-west Cape Province (Douglas, Kermoes, Gordonia, Vryburg). Clearly, then, the distribution of *A. moestum* s.str. is seen to be from Uganda and N. Nigeria to South-West Africa and the North-west Cape, but not by any means from " all over South Africa," since there are no specimens referred to by Uvarov (*loc. cit.*) from the East Cape Province, Natal, the Orange Free State, or Portuguese East Africa, which together form a very large part of " South Africa."

I have before me a specimen belonging to Rhodes University College and labelled " V. Thompson, Windhoek, June 1943 " which is certainly *A. moestum moestum* (Serv.) according to the key given by Uvarov (*loc. cit.* : 486–7) for distinguishing the two subspecies. I also saw a specimen collected in South-West Africa by J. Omer-Cooper in 1937 which belongs to this subspecies.

When one studies the distribution of *A. m. melanorhodon* (Wlk.), however, one finds that Uvarov's statement (*loc. cit.* : 486) that " the race represents a northerly form of *moestum* " is, in the light of further evidence, very much open to doubt; for the specimens in the South African Museum are from Pemba Bay (Nyasaland) and Lourenço Marques (Portuguese East Africa). On the strength of this evidence, Dr. Hesse has added " South-East Africa " to the distribution as given by Uvarov.

It was therefore very interesting that in May 1944, I caught a female which undoubtedly belongs to this subspecies at Grahamstown, in the East Cape Province of South Africa. It answers Uvarov's key description of *A. m. melanorhodon*, referred to above, in every respect.

Thus it is seen that *melanorhodon* cannot possibly be regarded as a *northerly* form of *moestum*, since it occurs as far south as Grahamstown, besides Nyasa-

land and Lourenço Marques. One would, in fact, be far more justified in calling it an *eastern* form since it is known to extend from Grahamstown to South-West Arabia, the Sudan, and Abyssinia, but for the extraordinary fact that, according to Uvarov, it occurs in Cape Verde.

This would suggest that *melanorhodon* might be a coastal or damp climate form, since it is recorded from the coasts of Portuguese East Africa, Eritrea, and South-West Arabia, as well as from the Cape Verde and Sokotra Islands,

Fig. 1.—The present known distribution of *A. moestum melanorhodon* (Wlk.) in Africa; in three apparently discontinuous areas.

and from Grahamstown, where the air is more often than not oppressively humid; but it also occurs in Khartoum, according to Uvarov.

Again, the distribution of *moestum* in Northern Nigeria, South-West Africa, North-West Cape Province, and Transvaal would suggest a drier climate form.

More records of these two very interesting subspecies are needed before the matter can be cleared up, finally, but one is certainly justified in refuting the idea that *melanorhodon* is a northern race, and its peculiar distribution certainly suggests that the two " subspecies " are, in fact, climatic forms.

2. *Acanthacris ruficornis lineata* (Stoll).

It appears to me that the distinction between this subspecies and *A. r. fulva* (Sjöst.) is a false one; they are supposed to be distinct by having the lateral pronotal lobes unicolorous (*fulva*) or with a brown fascia along the lower margin (*lineata*), according to Uvarov (1924 : 14–15); but every gradation between the two may be found even in series from the same locality, such as Grahamstown. The " ivory-white " of the median pronotal ridge is clearly a poor diagnostic character also, as in the series before me, pronotal ridges which can be so described, and others which cannot, are both present in specimens answering to both the " *fulva* " and the " *lineata* " characters of the lateral

pronotal coloration, and also in " intermediate " forms (with respect to the latter characteristic).

If it were found that these two supposed subspecies were respectively limited to well-marked distinct geographic regions, especially those commonly distinguished by having distinct subspecies in other groups—such as the West Cape Province of South Africa, and the East Cape Province plus north-east Africa as far as Uganda and Abyssinia (cf. the distribution of the subspecies of *Paracinema*, Key, 1936)—one might have a reason for hesitation in sinking the " subspecies *fulva*." There is no such reason. According to Uvarov (*loc. cit.* : 14–17), *lineata* occurs in " S.W. Africa " and is " confined to S.W. Africa from Namaqualand to Port Elizabeth, where it meets with *fulva* " (*loc. cit.* : 16), but a subspecies which occurs as far east as Port Elizabeth cannot possibly be described as being confined to " S.W. Africa ".

Now comparing the records given by Uvarov (*loc. cit.* : 16–17), it is found that *A. r. lineata* (Stoll) is given the localities of Rondebosch (West Cape Province), Namaqualand, Cradock (East Cape Province), Prom. Bonae Spei, Port Elizabeth; while *A. r. fulva* (Sjöst.) is described as distributed from " Port Elizabeth in the East of the Cape Province, the Natal and Transvaal up to Mozambique and Uganda," other localities given being in Tanganyika, Kenya, S. Rhodesia, Uganda, Transvaal (Pretoria, Fwambo, Rustenburg), Orange Free State (Bloemfontein, Baviaan Kraantz), Natal (Durban), and Cape Province (Barkly West, Knysna, Port St. Johns).

The records from which I made the above observations are as follows :— Specimens in the Albany Museum, Grahamstown; five specimens from Resolution, Fort Brown (*Miss Walton*, 1917); one specimen each from Brak Kloof, East Cape (*Mrs. G. White*), Robben Island West Cape (*Mr. A. Jones*), and Grahamstown (*Dr. Lea*, 26.ii.1912). Specimens in the collection of the Zoological Department, Rhodes University College; one each from East London (*B. Bradford*, xii.1940); Johannesburg (*D. E. Wilson*, i.1942); Oudtshoorn (*C. Meyer*, 24.i.1944); Stutterheim, East Cape (*M. Todd*, vii.1942); Gatooma, S. Rhodesia (*S. Cameron*, xii.1942); Fort Beaufort, East Cape (*J. Botha*, ii.1944); two from Graaf Reinet, E. Cape (*D. McGaffin*, ii.1941, and *A. Spies*, ix.1944); and ten specimens from Grahamstown, labelled respectively *J. S. Knoesen*, x.1942, *M. Roden*, x.1942, *S. Cameron*, vi.1942, *J. S. Knoesen*, ix.1942, *G. B. Sheard*, x.1941, *S. Bennie*, iii.1941, *S. H. McLoughlin*, iv.1937, *D. Rolly*, iii.1940, *E. F. Rose*, x.1942, and *A. Elmer*, viii.1943.

It becomes more and more obvious, bearing in mind the pioneer work of Uvarov and Faure on phases of locusts, formerly thought to be distinct species, and on the effects of crowding and isolation of hoppers on the coloration of the resulting adults, that coloration is a very unreliable factor indeed in diagnosing specific or sub-specific divisions of Acrididae.

I had this in mind when I described *Thalpomena algeriana flavipennis* as an aberration, and not as a more definite category (Chapman, 1938); but in the same paper I described *Sphingonotus coerulans atlas* as a subspecies, bearing in mind that this was the first record of the species from the African continent, and that as distinct subspecies occurred in parts of Europe and the Near East with climatic conditions very similar to those of Morocco, as well as in the Mediterranean Islands, I was in all probability not dealing with a mere climatic variation (Chapman, *loc. cit.* : 100). That these considerations are now clear to Uvarov also may be noted from the observation of Burtt and Uvarov (1944 : 8) that " Great caution should be exercised in regarding colour and pattern difference in Acrididae as taxonomic characters, since only some

of them may be attributed to genetical causes while others represent responses to environment of the nymphal stage and still others are due to metabolic processes in the adult." Now the characters given in Uvarov's key to the subspecies of *Acanthacris* (1924, *loc. cit.* : 14–15) are entirely coloration characters. It is, of course, the belief of Dr. Uvarov that it is better that any apparently new form should be described minutely, even if the category to which it is assigned is later denied to it (that is, it is " reduced in rank ") rather than not to describe it at all. At the same time, a note I made last year (Chapman, 1944) that : " It is only necessary to compare the species, genera, and other groups of insects with the similarly named categories " in other groups " to realise their non-equivalence " may be kept in mind; this is especially the case with regard to some groups of Lepidoptera, and in dealing with Orthoptera one may now perhaps realise that with regard to the ACRIDIDAE at least, our knowledge of the fauna of some parts of the world is now sufficiently extensive to permit of a closer approximation to equivalence of specific and other classificatory values with those of other animal groups than was possible before.

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TWO NEW SPECIES OF *ALLOTHRIPS* (THYSANOPTERA) FROM SOUTH AFRICA

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Allothrips cinctus sp. n. (figs. 1–3).

Female (apterous). Length about 1·4 to 1·7 mm. (fully distended). *Colour*: in reflected light over black paper: brown with a conspicuous white band covering the whole mesonotum and the posterior third of the pronotum, and extending to the mesosternum and prosternum also. The same white sub-epidermal pigmentation is also present in scattered blotches in the head, thorax and abdomen. In transmitted light: brown and yellow. Head brownish-yellow, eye-pigment black; antennae: iii to vii grey to light brown, iii palest in this series, others progressively darker, vii darkest; i grey, paler than iii, ii palest in whole antenna, greyish-yellow. Mouth-cone pale brown, palpi dark brown. Prothorax darker than head, yellow shaded with brown; mesothorax grey. Metathorax and i to ix of abdomen brown above and below; these segments pale yellowish-brown anteriorly, becoming progressively darker to viii which is dark brown; ix somewhat paler brown; tube yellow with basal one-eighth and distal one-fourth brown. All setae and spines yellow, inconspicuous. Legs: fore and hind coxae brown; middle coxae and hind femora pale brown tinged with yellow; middle femora largely yellow; fore femora and tibiae light brown in basal two-thirds and yellowish in distal one-third; all tarsi largely yellow.

Head about 1·2 as long as wide, widest at base, where the width is about 0·01 mm. to 0·02 mm. greater than across the eyes. Cheeks straight, diverging gently and evenly to base of head. Eyes large, dorsal length about 52 μ, ventral length 40 μ, interval 64 μ; each eye has about 15–18 facets on the dorso-lateral aspect and about five ventrally, the three facets in the dorsal posterior row much larger than the others; eyes scarcely protruding. Ocelli absent. Postocular spines about 48 μ to 56 μ in length, only about 10 μ from the edge of the caudal eye-facets, pointed or bluntly pointed, their apices transparent and difficult to see but probably not as sharply pointed as shown on the drawing. Other head setae minute.

Antennae as illustrated, nearly 1·9 as long as the head, the setae pale and inconspicuous. Sense cones long and conspicuous on iv–vii, the outer one on iv about 25 μ long and 3 μ wide near base; iii, 0–1; iv, 1–1; v, 1–1 (+1); vi, 1–0 (+1); vii, one on dorsum near middle and a cone-like seta at apex. None of the segments produced ventrally at apex.

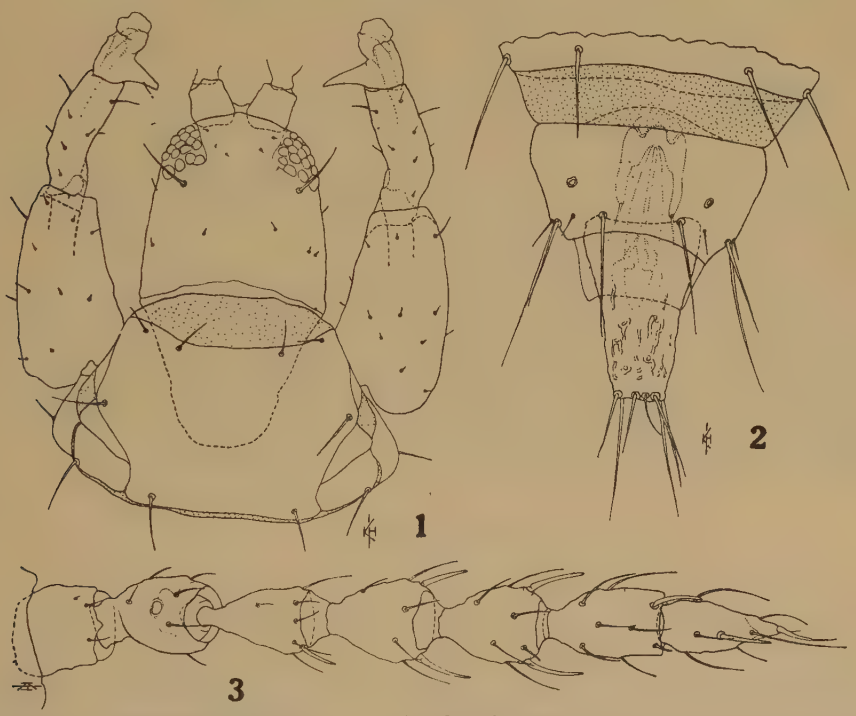
Mouth-cone broadly rounded at tip, length from dorsal posterior margin of head about 0·14 mm. Palpi well developed, maxillary pair about 48 μ and the labial about 20 μ in length; each pair bears a long curved seta apically, but these appendages are much more slender and inconspicuous than those on the palpi of *africanus* and *megacephalus*. Labrum bluntly pointed.

Prothorax about 0·11 mm. long and about 0·27 mm. wide at base (including coxae). Spines as illustrated, but probably not as sharply pointed as shown in the drawing; the tips very pale and difficult to see; anterior angulars about 28 μ, coxals about 32 μ, rest 40–44 μ in length; median pair on posterior margin minute (not shown on drawing).

Legs normal, setae pointed, fore femora about twice as wide as fore tarsi, the latter with a small tooth on inner side, about 4 μ in length.

Pterothorax slightly wider than prothorax; mesonotum with only one pair of bluntly pointed spines about 50 μ long situated near lateral margins; metanotum with one similar pair in postero-lateral angles, about 56 μ in length.

Abdomen broad and heavy, about 0·44 mm. wide; spines similar to those on metanotum, increasing in length posteriorly; the outer pair on ix about 95 μ long. Tube heavy, sides slightly concave, surface roughened, as illustrated; length about 108 μ, width at base 80 μ, at apex 32 μ; longest terminal seta about 88 μ.



FIGS. 1–3.—*Allothrips cinctus* sp. n. 1. Head and prothorax; 2. tip of abdomen, male, allotype, cleared in NaOH; 3. right antenna, female, paratype. (Miss K. Howitson del.)

Measurements of holotype (female) in mm.:—Length 1·7 (fully distended); head length 0·18, width across eyes 0·14, at base 0·15, prothorax length 0·11, width 0·27, spines: posterior angles 0·044, on coxae 0·032, hind margin 0·04, mid-laterals 0·04, antero-angulars 0·028, on anterior margin 0·044; pterothorax length 0·12, width 0·3, abdomen length 1·2, width 0·44; tube length 0·108, setae 0·088, width at base 0·08, at apex 0·032; spines on 9th abdominal 0·095. Legs: fore-leg femur length 0·12, width 0·06; tibia length 0·1, width 0·04; tarsus length 0·04, width 0·03, tooth 0·004. Antenna length 0·34 mm.

	i	ii	iii	iv	v	vi	vii
length in μ	32	40	40	44	44	48	56
width in μ	40	32	28	32	32	32	20

Male (apterous). Length about 1·08 mm. to 1·36 mm. (fully distended). Smaller than female but very similar in coloration and structure. Fore femora enlarged in allotype,

and fore tarsi with a strong tooth about 40 μ in length; in the other two males the femora are narrower and the tarsal teeth only about 20 μ to 24 μ long. Segments iv to vi of antennae not produced ventrally.

Measurements of allotype (male) in mm.:—Length 1·36 (fully distended, cleared in NaOH), head length 0·16, width across eyes 0·12, at base 0·15; prothorax length 0·12, width 0·27, spines: posterior angles 0·04, on coxae 0·028, on hind margin 0·044, mid-laterals 0·036, antero-angulars 0·028, on anterior margin 0·028; pterothorax length 0·092, width 0·26; abdomen length 0·9, width 0·32, tube length 0·092, setae 0·068, width at base 0·064, at apex 0·028, spines on 9th abdominal 0·055. Legs: fore-leg femur length 0·16, width 0·08; tibia length 0·1, width 0·04; tarsus length 0·04, width 0·03, tooth 0·04. Antenna length 0·3 mm.

	i	ii	iii	iv	v	vi	vii
length in μ .	36	36	44	40	36	46	46
width in μ .	32	32	28	32	28	28	20

Two females on *Conicasia* [1] sp.; three males and one female on *Hermannia helianthemum* Schum.,[1] taken by the author at Graafwater, Clanwilliam district, S.W. Cape Province, 3.xii.1943. Both plants are shrublets less than two feet in height.

This interesting species differs strikingly from *megacephalus* Hood, the genotype, *africanus* Faure, *acaciae* sp. n. and probably also from *watsoni* Hood and *nubillicauda* Watson in (i) the pointed setae, (ii) the absence of the inner sense-cone on the third antennal segment, (iii) the presence of 15–18 facets in the eyes, (iv) the unproduced segments iv to vi of the antennae and (v) the presence of only one pair of spines on the mesonotum. *A. caudatus* Bagnall is a larger species, with the tube longer than the head.

Allothrips acaciae sp. n.

Female (apterous). Length about 1·38 mm. to 1·6 mm. (fully distended). *Colour* in transmitted light: brown, with tube, tarsi and second antennal segment paler; head, thorax and abdomen except tube uniformly brown with reddish sub-epidermal pigmentation; antennae: iv to vii uniformly brown like head, iii slightly paler, ii distinctly paler than iii, greyish-brown, yellow at apex, i similar to iii but paler towards base; legs brown like head, except all tarsi, distal third of fore tibiae and extreme apices of other tibiae, which are pale grey, tinged with yellow; tube: distal one-fourth brown, rest yellow; spines and setae greyish-yellow, transparent.

Head about 1·14 to 1·18 as long as wide, widest at about basal third, slight narrower at eyes and at base; cheeks practically straight. Eyes consisting of three large facets only, the posterior one separated by approximately its own length from the other two which are contiguous; the total length of the eye about 40 μ, its width about 20 μ and the interval about 92 μ; the two anterior facets of each eye sub-spherical, protruding. Ocelli absent. Postocular spines about 32 μ in length, situated about 8 μ from posterior eye-facets; interoculars and spines latero-ventrad of eyes about 24 μ, dorsal head spines about 20–24 μ and situated half-way between eyes and posterior margin of head; all head spines expanded at apex.

Antennae about 1·7 as long as the head, very similar in general appearance to those of *megacephalus* Hood, with iv slightly wider than long. Sense cones well developed, the outer one on iv about 25 by 3 μ:—iii, 1–1; iv, 1–1; v, 1–1 (+1); vi, 1–0 (+1); vii one

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* Kindly determined by the National Herbarium, Pretoria.

on dorsum. Segments v and vi produced slightly on ventral side at apex, as in *megacephalus*.

Mouth-cone broadly rounded at apex, length from posterior dorsal margin of head about 128 to 132 μ. Maxillary palpus: second segment about 40 μ, terminal seta about 16 μ in length. Labrum bluntly pointed.

Prothorax about 0·1 mm. long and about 0·25 mm. to 0·26 mm. wide at base (including coxae). The usual spines present, expanded apically, but somewhat shorter than in *megacephalus*; anterior angulars about 20–24 μ, anterior marginals 24–32 μ, mid-laterals 28 μ, rest about 28–36 μ, except medials on posterior margin which are minute, only about 4–6 μ. Legs normal, some of their setae expanded at apex, fore tarsi unarmed.

Pterothorax only about 13 μ wider than prothorax, its length about 0·124 mm.; mesonotum with only six expanded spines, the two lateral pairs about 20–32 μ long, the median pair more slender and only about 12 μ; the two lateral spines are only about 8–12 μ apart and the outer one is adjacent to the lateral margin of the mesonotum. In *megacephalus* and *africanus* the mesonotum bears three pairs of large expanded spines whereas the new species bears only two.

Abdomen about 0·11 mm. wider than pterothorax, heavy. The spines more or less as in *megacephalus*, but the expanded ones on segments v to viii are about 16 to 32 μ shorter. Tube not sculptured, sides converging evenly from base to apex, length about 104–112 μ, width at base 68–72 μ, at apex 40 μ; terminal setae about 160 μ.

Measurements of holotype (female cleared in NaOH) in mm.:—Length 1·48; head length 0·18, width across eyes 0·15, at base 0·15, greatest width 0·157; prothorax length 0·108, width 0·248; spines: posterior angles 0·028, on coxae 0·028, hind margin 0·032, mid-laterals 0·028, antero-angulars 0·02, on anterior margin 0·024; pterothorax length 0·124, width 0·248; abdomen length 1·0, width 0·361; tube length 0·112, tube setae 0·16, tube width at base 0·068, at apex 0·04; spines on 9th abdominal 0·095. Legs: fore-leg femur length 0·128, width 0·052; tibia length 0·1, width 0·036; tarsus length 0·052, width 0·024. Antenna length 0·3 mm.

	i	ii	iii	iv	v	vi	vii
length in μ .	32	48	44	32	36	36	56
width in μ .	36	36	32	34	32	30	28

Male (apterous). Length 1·12 mm. to 1·2 mm. (distended). Colour very similar to that of female, but slightly paler; fore tibiae and tarsi, including the tooth, almost wholly yellow, shaded very narrowly with brown. Structure similar to that of female with these differences:—fore femur enlarged, about 160 μ long by 90 μ wide; fore tarsus with a strong tooth, about 20 μ to 24 μ long. Segments iv–vi of the antennae produced ventrally at the apex as in *megacephalus*. Measurements of allotype (male) in mm.:—Length 1·2 (distended); head length 0·16, width across eyes 0·13, at base 0·13, greatest width 0·14; prothorax length 0·11, width 0·26; spines: posterior angles 0·032, on coxae 0·032, on hind margin 0·028, mid-laterals 0·024, antero-angulars 0·024, on anterior margin 0·02; pterothorax length 0·14, width 0·24; abdomen length 0·76, width 0·3; tube length 0·092, setae 0·154, width at base 0·064, at apex 0·032; spines on 9th abdominal 0·105, on 8th 0·056. Legs: fore-leg femur length 0·16, width 0·92; tibia length 0·104, width 0·036; tarsus length 0·052, width 0·028; tooth 0·024. Antenna length 0·26 mm.

	i	ii	iii	iv	v	vi	vi
length in μ .	38	48	40	32	32	36	56
width in μ .	36	32	32	32	28	30	28

Saltpan, Pretoria district, Transvaal, 5th April 1944: 11 females and 2 males taken by the author in beating dead branches of a native Acacia.

This new species closely resembles the genotype, *A. megacephalus* Hood, but differs from it in the following characters: (1) mesonotum with two pairs of large expanded spines instead of three; (2) posterior median marginal setae of pronotum minute; (3) the expanded spines near the postero-lateral angles of the abdominal segments v to viii about 16 μ to 32 μ shorter.

From *watsoni* Hood the new species differs in (i) only two pairs of large mesonotal spines, (ii) median mesonotals expanded at apex and about 12 μ long, (iii) epimeral spines of prothorax 28–34 μ long; (iv) segment iii of antennae not yellow.

The new species differs from *africanus* Faure and *nubillicauda* Watson in its darker colour and the shorter third antennal segment. The comparison with *A. cinctus* sp. n. has been given above under the latter; *caudatus* Bagnall differs in having the tube longer than the head.

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